Paula Goodman Maccabee, Esq.
Just Change Consulting/Public Interest Law
1961 Selby Ave., St. Paul, Minnesota 55104, pmaccabee@visi.com
Ph: 651-646-8890, Fax: 651-646-5754, Cell 651-775-7128
http://www.justchangeconsulting.com

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William Cole Storm, Project Manager
Office of Energy Security
85- 7th Place East, Suite 500
St. Paul, MN 55101-2198

RE: Environmental Impact Statement
Xcel Energy Prairie Island Nuclear Generating Plant
Extended Power Uprate Project, PUC Docket No. E002/CN-08-509, E002/GS-08-690
Request for Additional Dry Cask Storage, PUC Docket no. E002/CN-08-510

Dear Mr. Storm:

The following comments pertaining to the March 17, 2009 Draft Environmental Impact Statement ("DEIS") for the Xcel Energy Prairie Island Nuclear Generating Plant Extended Power ("PINGP") Uprate Project ("Uprate") and the Request for Additional Dry Cask Storage for high-level nuclear waste ("Cask Increase") are submitted on behalf of the Prairie Island Nuclear Generating Plant Study Group. The PINGP Study Group includes members of the Advisory Task Force appointed to comment on the scope of environmental review of the nuclear uprate and nuclear cask increase who have continued to meet after the completion of their formal report. The Study Group represents the concerns of citizens, environmental protection groups and local governments.

In order to extend its license for the Prairie Island Nuclear Generating Plant until 2034, Xcel Energy has proposed to expand storage of high-level nuclear waste, the nuclear spent fuel generated by the plant. Xcel currently stores nuclear spent fuel in 24 casks at the PINGP, and is authorized for 29. Xcel has applied for a certificate of need and site permit for 35 additional casks at the PINGP, which would more than double the amount of high-level nuclear waste stored on site at the Prairie Island Nuclear Generating Plant, bringing the total casks to 64 by 2034. (*DEIS, Ch. 2, pp. 1, 8*). There is no foreseeable prospect for a federal repository that would permit removal of this high-level nuclear waste.

In addition, Xcel has filed a certificate of need to increase by 164 MW the nuclear power produced by the Prairie Island Nuclear Generating Plant. This uprate would be obtained by increasing temperature, pressure and the amount of uranium in the reactor core to maintain the same fuel cycle length. The Nuclear Regulatory Commission hasn't yet approved the safety of the design. (*DEIS, Ch.1, pp. 2, 4*)

These proposals to continue reliance on non-renewable nuclear generation, more than double storage of high-level nuclear waste and increase the temperature and use of uranium at the

Prairie Island Nuclear Generating Plant create significant environmental impacts and raise serious economic and policy concerns, which both the Minnesota Public Utilities Commission and the Minnesota Legislature are required by law to consider. The purpose of an EIS is to provide sufficient analysis to allow decision-makers to select alternatives and mitigation to minimize adverse impacts and address policy concerns. From the perspective of the Study Group, the DEIS for the above-described Prairie Island Nuclear Generating Plant projects is so incomplete that it fundamentally fails to serve its function under law. It is respectfully requested that the additional analysis, alternatives and mitigation proposed in these comments be included in the Final EIS for the PINGP projects to ensure both compliance with law and effective decision-making.

By law, an EIS must be a "detailed" and "analytical" document prepared by the responsible governmental unit, which "describes the proposed action in detail, analyzes its significant environmental impacts, discusses appropriate alternatives to the proposed action and their impacts, and explores methods by which adverse environmental impacts of an action could be mitigated." (Minn. Stat. 116D.04, Subd. 2a). Under either the Minnesota Environmental Policy Act (MEPA) or the National Environmental Policy Act (NEPA) law on which it was based, "grudging, pro forma compliance will not do. . . the courts can, and should require full, fair, bona fide compliance." *No Power Line v. MEQC*, 262 N.W. 2d 312, 327 (1977 Minn.), citing *Lathan v. Brinegar,* 506 F.2d 677, 693 (9 Cir. 1974). A number of courts have held that it is an abdication of agency responsibility to rely solely on information prepared by a project's proponent. *See e.g., Greene County Planning Bd. v. Federal Power Comm.,* 455 F.2d 412, 420 (2 Cir. 1972).

The Prairie Island Nuclear Generating Plant DEIS unduly relies on inaccurate assertions made by Applicants, fails to consider critical alternatives, disregards applicable Minnesota policies regarding demand side management, renewable energy and environmental justice, inappropriately excludes consideration of substantial economic costs and environmental externalities pertaining to the Request for Additional Dry Cask Storage for nuclear spent fuel and the Extended Power Uprate, fails to evaluate mitigation measures that are within State jurisdiction and provides incomplete health risk assessment analysis. In addition, the DEIS fails to take into account substantial new information regarding the failure of plans for a federal nuclear waste depository at Yucca Mountain and regarding declines in energy demand of Xcel Energy.

The DEIS fails to provide either the public, the Minnesota Public Utilities Commission or future Legislative decision-makers with appropriate information from which to determine the critical decisions that are within State jurisdiction in connection with the Prairie Island nuclear power generating plant:

- Is Xcel's proposal to more than double cask storage for high-level nuclear waste prudent given the lack of any prospect for a federal depository for spent fuel from the Prairie Island Nuclear Generating Plant and the likelihood that nuclear waste will be stranded indefinitely in the Mississippi River floodplain, immediately adjacent to the Prairie Island Indian Community and within 50 miles of Minnesota's primary population center?

- Are there feasible and prudent alternatives to Xcel's proposal to increase nuclear waste cask storage and continue operation of the PINGP for at least another 25 years, given the full range of economic costs implicated by this proposal, State policies favoring demand side management and renewable energy and opportunities presented by recent declines in energy demand?

- If nuclear spent fuel cask storage will be needed for decommissioning and other purposes, what sites and criteria would mitigate environmental and human health risks of long-term radioactive waste storage consistent with environmental justice?

- Is Xcel's uprate proposal to obtain 164 MW of additional nuclear power from the Prairie Island Nuclear Generating Plant through increases in heat, pressure and uranium in the reactor core needed at all, once current electric demand information is considered?

- What measures would mitigate adverse non-radiological impacts of Xcel's proposal to increase heat and production at the Prairie Island nuclear generating plant?

- What are the cumulative cancer risks from all sources (air emissions, releases to water, skyshine radiation from casks, food source contamination) to employees and to the public presented by each aspect of Xcel's proposals?

The Final EIS should include at least the following analysis:

1. The economic and policy implications of the cask increase and continued operation of the PINGP through 2034 should be analyzed given circumstances precluding any realistic consideration of a federal nuclear waste depository, without imposing any arbitrary limit on the duration that casks will be stranded at the nuclear plant site.

2. The economic and policy implications of the cask increase and continued operation of the PINGP through 2034 should be analyzed including all economic costs of nuclear wastes and all health and environmental impacts of continued operation of the PINGP.

3. Alternatives to the cask increase and continued operation of the PINGP through 2034 should be analyzed in light of State policy preferences for demand side management and renewable energy, recent changes in electric demand and approvals of transmission.

4. Alternative sites for nuclear waste storage for decommissioning and other purposes should be considered, along with an analysis of the criteria that affect risks of nuclear spent fuel storage, such as location on a flood plain or near population centers.

5. Environmental justice implications of restricting consideration of additional nuclear waste cask storage to the area immediately adjacent to the Prairie Island Indian Community reservation should be evaluated.

6. Need for the 164 MW PINGP uprate should be reevaluated, using current information on Xcel's energy demand and reasonable forecasts.

7. Feasible and prudent alternatives to the 164 MW PINGP uprate should be reevaluated consistent with State policy preferences for demand side management and renewable energy, considering emissions reduction, smart grid and purchased power.

8. Mitigation measures to reduce thermal and other non-radiological impacts of the proposed uprate should be explicitly discussed, consistent with comments made by the Minnesota Department of Natural Resources.

9. Cumulative cancer risks from all PINGP sources of radiation to employees and to the public should be analyzed consistent with State health policies to evaluate impacts of Xcel's proposals for continued operation of the PINGP, spent fuel storage increases and power uprate increases.

1. Economic and Policy Analysis of Indefinite Storage of Stranded Nuclear Waste

Indefinite storage of stranded nuclear wastes is a critical economic and policy consideration in these proceedings. As the United States Court of Appeals for the District of Columbia Circuit recently explained in Nuclear Energy Institute, Inc. v. EPA, *373 F.3d 1251, 1257-1258 (U.S. App. D.C. 2004):*

> Having the capacity to outlast human civilization as we know it and the potential to devastate public health and the environment, nuclear waste has vexed scientists, Congress, and regulatory agencies for the last half-century.
>
> Although nuclear power burns without emitting harmful greenhouse gases, it produces a potentially deadly and long-lasting byproduct: highly radioactive spent nuclear fuel.
>
> At massive levels, radiation exposure can cause sudden death. National Institutes of Health, Fact Sheet: What We Know About Radiation, *at* http://www.nih.gov/health/chip/od/radiation (last visited May 28, 2004). At lower doses, radiation can have devastating health effects, including increased cancer risks and serious birth defects such as mental retardation, eye malformations, and small brain or head size. *See Environmental Radiation Protection Standards for Yucca Mountain, Nevada, 64 Fed. Reg. 46,976, 46,978 (Aug. 27, 1999).*
>
> Radioactive waste and its harmful consequences persist for time spans seemingly beyond human comprehension.

The Court of Appeals for the District of Columbia Circuit upheld the State of Nevada's challenge to a United States Environmental Protection Agency decision to limit consideration of the effects of the proposed Yucca Mountain federal nuclear waste depository to "only" 10,000 years. The Court determined that radiation exposure risks and the need for geological stability could extend to several hundreds of thousands of years. *NEI v. EPA, supra, 373 F. 2d at 1270-1271.*

The budget released by President Barack Obama at the end of February 2009 cut off almost all funding to create a permanent federal repository burial site for radioactive nuclear waste in Nevada. As reported in the *Washington Post* on March 4, 2009, the Department of Energy stated, "Yucca Mountain is not an option and the budget clearly reflects that." *(http://www.washingtonpost.com/wp-dyn/content/article/2009/03/03/AR2009030303638.html)*

Any evaluation of additional cask for high-level nuclear waste at the Prairie Island Nuclear Generating Plant must consider the fact that nuclear waste must be managed indefinitely to prevent harmful radiation consequences, certainly more than 10,000 years. The recent elimination of funding for Yucca Mountain precludes any assumption that new nuclear waste stored at the PINGP will be transported to a federal repository within any foreseeable time frame. Based on current information, analysis of the consequences of nuclear waste storage at the Prairie Island Nuclear Generating Plant must consider the possibility that the nuclear waste will be stranded there indefinitely

The DEIS in these proceedings at best minimizes and, at worst, distorts the implications of increased long-term indefinite storage of nuclear wastes at the nuclear power plant site. The DEIS states that "spent fuel is in interim storage" since neither a reprocessing facility nor a federal waste repository is "currently approved." (*DEIS, Ch.1, p. 9*) The DEIS admits that "there is uncertainty" as to the storage alternatives that will be available in the future, but then suggests that "a likely scenario is temporary long-term storage of spent nuclear fuel at the Prairie Island ISFSI until the dry storage casks can be transported to a federal repository" (*DEIS, Ch. 2, pp. 22 -23*). The DEIS then arbitrarily assumes for purposes of its analysis that up to 98 nuclear waste casks will be at the PINGP for a period not exceeding 200 years. (*DEIS, Ch. 2, p. 23*). There are several flaws in this analysis.

First, the DEIS fails to discuss the implications of even its arbitrary 200-year time limit on weathering, degradation, maintenance and security of increased nuclear spent fuel storage. The DEIS states that the minimum design life for the TN-40 series of nuclear spent fuel casks is 25 years (*DEIS, Ch. 2, p.13*), but provides no information as to the period of time for which casks have been warrantied or tested. The DEIS notes that the NRC's waste confidence rule is 60 years beyond the licensed life for operation (*DEIS, Ch. 2, p. 36*), without explaining the difference between this temporary limit and potential indefinite storage at the Prairie Island site. The DEIS does note,

> Confidence at the NRC that temporary, long-term storage of dry casks at ISFSIs nationwide can be effected safely does not provide or supplant an independent decision by the State of Minnesota regarding the risks of long-term storage of dry casks at the Prairie Island ISFSI. (*DEIS, Ch. 2, p. 37*)

The current cask storage system at PINGP relies on a 7.25-inch thick steel cylinder welded to a bottom shield plate. Casks are sealed with an O-ring system and pressurized with helium, so

that a drop in pressure may be monitored to determine failure of either inner or outer seals of the cask. (*DEIS, Ch. 2, p. 12*) The first dry storage cask was installed at the PINGP in 1995, only fourteen years ago. Since that time, there have been 8 low-pressure alarms. Upon investigation, leaks in monitoring system tubing or pressure transmitters have been identified, rather than cask seal leaks. Xcel has no experience with removal of casks for repair or replacement of seals. (*DEIS, Ch. 2, p. 13*). The DEIS provides no information regarding the likelihood of alarms, leaks in the monitoring system or in cask seals over 200 years given the increased number of nuclear spent fuel casks proposed by Xcel Energy.

The DEIS notes that casks are visually inspected periodically for "signs of weathering" and that casks are painted with a "corrosion-inhibiting coating" which is "inspected and touched up as necessary." (*DEIS, Ch. 2, p, 13*). The DEIS contains no information as to the likelihood of steel or weld corrosion and weathering under various conditions for a period extending to 200 years or beyond. The DEIS discusses security provided by an intrusion detection system and a security force (*DEIS, Ch.2, p. 13*) but provides no indication of how fences, electronic systems or human patrols will be assured for 200 or more years.

The DEIS makes conclusory statements rather than analyzing the significance of radiological and non-radiological risks of continued operation given time, weathering, deterioration and natural and man-made phenomena. Although the DEIS admits that, "The risk that is introduced by storing the casks for 200 years is time itself," (*DEIS, Ch. 2, p. 35*), the DEIS then assumes that the integrity of materials, seals and welds is unaffected by time, so that the ability of casks to withstand an earthquake, a flood and a tornado within a 200-year period is unaffected by time or deterioration. (*DEIS, Ch. 2, pp. 23, 35*). The DEIS also assumes, without requiring any mechanism for assurance, that monitoring and maintenance will be unaffected by more than doubling of nuclear waste storage casks, decommissioning and a time frame extending 200 years into the future. (*DEIS, Ch. 2, p. 35*).

The DEIS does not explicitly discuss the cumulative radiological impacts of continued operation of the Prairie Island Nuclear Generating Plant through 2034, the increase in waste storage on site needed for this extension or the radiological risks of indefinite on-site storage of nuclear wastes, all of which information is required to evaluate the policy and economic risks of Xcel's proposals. The DEIS merely states, "The potential radiological impacts of the continued operation of the PINGP are discussed in Chapter 1 of this DEIS. It's anticipated that no new or additional impacts, beyond those discussed in Chapter 1, would occur if the PINGP continued operations through 2034." (*DEIS, Ch. 2, p. 33*). In hypothesizing cask confinement failure, the DEIS does not discuss the possibility of multiple releases over a time frame of decades or centuries or estimate cancer risks from exposures. (*DEIS, Ch. 2, pp. 32-33).*

The PINGP Study Group believes that far more information should be contained in the Final EIS pertaining to potential failure of nuclear spent fuel casks over time due to extreme weather, terrorism, accident, long-term materials degradation, failures of maintenance and combinations of the above variables. The Final EIS should evaluate the projected lifespan of waste storage casks, including both the existing TN-40 and proposed TN-40HT based on warranties and tests of materials, welds and seals and analyze risks of radiological exposure

under Xcel's proposal and under no-action alternatives. The Final EIS should also develop a timeline and funding plan for facility and cask maintenance and repairs according to the timelines suggested in the Yucca Mountain EIS and EPRI dry cask reports. Much of this information was specifically requested by the Advisory Task Force (*ATF Summary, EIS Scoping Worksheet/Exclusions, p.16, EIS Scoping Worksheet, p. 9; Meeting #3, p. 4*), but was disregarded by the Office of Energy Security in preparing the DEIS.

Consistent with the Court of Appeals decision in *NEI v. EPA*, the Final EIS should not be allowed to arbitrarily assume a 200-year limit on the risks of cask failure, security failure or radiological exposure from nuclear waste storage at the Prairie Island Nuclear Generating Plant. There is no evidence or assurance in the Application or the DEIS demonstrating either that casks will be removed by that time or that the highly radioactive spent fuel contained within them will cease to pose human and environmental risks within the brief time window of 200 years.

Even with the profound limitations in the analysis provided in the DEIS, the Study Group believes that sufficient concerns have been raised that risks of indefinite nuclear cask storage may outweigh potential benefits. As noted in the DEIS:

> It is possible that armaments could be used to attack the casks, creating damage or a fire that causes a cask seal failure. An airplane could be commandeered to attack the casks. These risks are difficult to assess and include substantial uncertainties. (DEIS, Ch. 2, p. 31)
>
> Time is also a consideration for risks posed by man-made phenomena that, unlike cask handling, will exist for the full 200 years and may change over time, e.g., risk of explosion, terrorism, airplane impact. . . Compared with natural phenomena and well-regulated cask handling systems, risks posed by these man-made phenomena are likely the more uncertain. (DEIS, Ch. 2, p.36)

2. Economic Costs and Risks of Cask Storage, Continued Nuclear Plant Operation

The United States Supreme Court has determined that it is within a State's jurisdiction to determine, as a matter of economic costs and risks, that a nuclear power plant should not be constructed or operated. *Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission, 461 U.S. 190 (1983)*. Specifically, the United States Supreme Court has upheld a state judgment imposing a moratorium on nuclear power due to the economic costs and risks of further development of nuclear power plants before adequate spent nuclear fuel facilities had been provided. *Id., at 216*. The Court concluded that the moratorium did not conflict with the objectives of federal law. Although the primary purpose of the Atomic Energy Act is the promotion of nuclear power, that power is not to be developed "at all costs." *Id., at 222*. Congress has left to the states to determine whether, as a matter of economic costs and risks, continued reliance on nuclear power should be authorized.

The DEIS clearly states that the State of Minnesota "decides as an economic and policy matter whether it is in the public interest to allow additional storage of spent nuclear fuel at the Prairie Island ISFSI in order to allow the PINGP to continue operating until 2034." (DEIS, p. vi, see also Ch. 2, p. 3). However, the DEIS provides an insufficient analysis of the economic and policy considerations in allowing additional storage of spent nuclear fuel at the nuclear plant.

Minnesota's certificate of need law provides, "Any certificate of need for additional storage of spent nuclear fuel for a facility seeking a license extension shall address the impacts of continued operations over the period for which approval is sought." Minn. Stat. § 216B.243, Subd. 3b(b). The DEIS' analysis of the impacts of continued operations of the Prairie Island Nuclear Power Plant is incomplete and fragmented.

Section 9 of these comments addresses gaps in the human health risk assessment of impacts of increased storage of spent fuel and continued operations at the Prairie Island Nuclear Generation Plant. This Section suggests that the Final EIS and further proceedings in this matter should quantify the economic costs and risks associated with the cask increase and continued operation of the PINGP, including costs and risks associated with health externalities and costs and risks of indefinite long-term maintenance on site of highly radioactive nuclear wastes.

The DEIS suggests that the primary sources of information regarding the cask increase were the applications filed by Xcel Energy. (*DEIS, Ch. 2, p.1*). Xcel's present value revenue requirements ("PVRR") analysis of the economic benefits of its proposed nuclear license extension and cask increase included no externality values either for continued operation of the nuclear plant or for increases high level radioactive waste storage. Costs for carbon dioxide were attributed to coal and natural gas alternatives, but no greenhouse gas impacts or other externalities were allocated to the process of uranium mining, milling, enrichment or fuel fabrication for nuclear power. (*Application to the MPUC for Certificates of Need for the PINGP for Additional Dry Cask Storage and Extended Power Uprate "Application," Table 4-4, p. 4-16*). Xcel's PVRR analysis effectively excludes the risks and economic costs associated with Xcel's proposals.

Read carefully, the DEIS suggests some of the economic risks and costs associated with Xcel's proposed cask increase in reliance on nuclear power, but a more detailed and thorough analysis is required to guide public decision-making. First, it is clear that storage and disposal of radioactive wastes incurs substantial costs. The DEIS notes that in 2008 dollars, the current cost estimates for decommissioning the Prairie Island Nuclear Generating Plant are $1.026 billion for radiological removal, $83.7 million for site restoration and $404 million for operation of the spent nuclear fuel cask installation. (*DEIS, Ch. 2, p. 15*). Though to date receiving no benefit from this cost, by December 2006 Xcel Energy's customers had paid approximately $620 million into the federal Nuclear Waste Fund to finance nuclear waste management. (*DEIS, Ch.2, p. 42*).

The DEIS does not provide information from which it could be determined whether these projected costs reflect a minimum or maximum expenditure and over how many years it is projected that costs would be incurred for indefinite long-term storage of nuclear wastes. The DEIS states that if the cask increase is approved, from April 15, 2008 through 2034 nearly double the amount of spent fuel assemblies will be discharged from Prairie Island's reactors (3,895) as have been discharged from the time the nuclear power plant began operation through April 15, 2008 (2,109). (*DEIS, Ch. 2, p. 14*) However, no information is provided as to the degree that the sheer volume of spent fuel would affect costs for radiological removal and nuclear waste management in future decades or centuries.

The DEIS, similarly, provides insufficient information regarding the risks and externalities associated with the uranium fuel cycle. It is noted that conversion of uranium yellowcake to uranium hexafluoride results in chemical and radiological risks and "extremely corrosive" chemicals and that there is only one uranium conversion plant operating in the United States. The DEIS further explains that the primary hazard in the uranium enrichment process is the chemical and radiological hazard of uranium hexafluoride release and that there is only one gaseous diffusion uranium enrichment plant in the U.S. The DEIS further notes that the next stage in producing nuclear fuel, fuel fabrication, has similar "chemical, radiological and criticality hazards." (*DEIS, Ch. 1, pp. 6-8)*. No information is provided as to the chemical and radiological externalities, the consumption of fossil fuel energy and CO_2 required in the uranium fuel cycle or the risks that may be entailed by the scarcity in production resources.

The DEIS notes that, if the continued operation of the Prairie Island Nuclear Generating Plant avoids the uncertainties of greenhouse gas emissions at the time of combustion, it does so by trading them for uncertain costs related to the safe handling, storage, and eventual placement in a federal repository of spent nuclear fuel (SNF) generated at the PINGP. (*DEIS, Ch. 2, p. 54*). If these economic risks and uncertainties were fully analyzed in light of the failure to secure a federal repository for wastes at Yucca Mountain, decision-makers might conclude that neither the Prairie Island Nuclear Generating Plant nor the proposed expansion of indeterminate long-term radioactive waste cask storage is in the public interest.

3. Energy Policy Analysis of Cask Increase, Prairie Island Nuclear Generating Plant

The DEIS provides an analysis of alternatives to granting the certificate of need for a nuclear waste cask increase, describing several different alternative scenarios that could replace 1,100 MW of generating capacity from the Prairie Island Nuclear Generating Plant. (*DEIS, Ch. 2, pp. 47-56)*. The DEIS also acknowledges that potential human and environmental impacts of each of these scenarios could be proportionately reduced by demand side management (*DEIS, Ch. 2, p. 48*).

This analysis is helpful, but incomplete. Not only must costs and externalities of continued reliance on nuclear power be evaluated (*Section 2, supra*), but State certificate of need policies and new information regarding electric demand and transmission must be analyzed in the Final EIS to evaluate feasible and prudent alternatives to Xcel's nuclear proposals. The

Study Group believes that an updated analysis could demonstrate that demand side management and renewable energy backed up by natural gas or purchased power provide feasible and prudent alternatives which are more consistent with State policy and create fewer adverse environmental impacts than continued operation of PINGP and increased nuclear waste storage. New information regarding declines in electric demand and the availability of transmission to support large wind energy conversion systems across Minnesota to the Buffalo Ridge area should be included in this updated alternatives analysis.

First, the assumptions regarding electric demand in Xcel's Application and in the DEIS are out-of-date and thus inaccurate. Xcel stated in its Application, based on a December 14, 2007 Resource Plan filing, that annual energy demand and energy would grow at a rate of about 1.1 percent per year, or 133 MW per year, so that Xcel would have a 126 MW energy deficit by 2012 and a deficit of over 2,800 MW by 2022. (*Application, 1-6, 1-7, 9-4*). These projections were accepted in the DEIS. (*DEIS, Ch.1, pp. 12,24*). The base line for this energy need was provided in the Application in Figure 9.1, which represented net 2008 summer peak demand at approximately 9,250 MW. *(Application, 9-5)*

More recent information indicates that projections from this base line would overstate demand and energy deficits. According to Xcel's Form 10-K filed with the SEC on February 27, 2009, *(http://www.secinfo.com/dVut2.s1Uy.htm#1stPage, p. 10*), Xcel's peak demand declined 11.79 percent from 2006 through 2008, and actual summer peak demand in 2008 was 8,697 MW, more than 500 MW lower than what was assumed in the Application and DEIS.

In its February 9, 2009 Resource Plan Update, Xcel proposed to delay several resources due to the "economic downturn" and the need "to address the effects of this recession." (*Resource Plan Update, 2/9/09, MPUC Docket No. E002/RP-07-1572, p. 2*). In conversations with industry media shortly after this filing, Xcel reported that Minnesota was seeing sales decline in its service territory, mainly with residential customers. As a result of the slumping economy, Xcel projected peak load declines of 374 MW in 2012 and of 613 MW by 2023 as compared with its December 2007 Resource Plan. (*Global Power Report, February 12, 2009*).

Declines in Xcel's peak demand provide a greater opportunity to evaluate feasible and prudent alternatives to increased nuclear waste storage and continued operation of the Prairie Island Nuclear Power Plant, consistent with the policy priorities of Minnesota's certificate of need law. The Final EIS should base its assessment of feasible and prudent alternatives to the PINGP on accurate demand information and Minnesota certificate of need policy.

Minnesota's certificate of need law states a clear preference for demand side management as an alternative to any large energy generation facility:

> No proposed large energy facility shall be certified for construction unless the applicant can show that demand for electricity cannot be met more cost effectively through energy conservation and load-management measures and unless the applicant has otherwise justified its need. (*Minn. Stat. § 216B.243, Subd. 3*)

Smart grid technology, as well as incentive programs historically implemented by utilities, should be explicitly evaluated in the Final EIS and in further proceedings to determine whether demand side management provides a cost-effective alternative, in whole or in part, to a large energy facility. A number of communities are already applying smart grid technologies to substantially reduce peak demand. In addition to the Xcel project in Boulder, Colorado, the large metropolitan area of Austin, Texas has begun implementation of smart grid technology. Approximately $4.5 billion has been allocated in the current federal stimulus package to support smart grid technology. (*The Wall Street Journal, April 1, 2009*).

Minnesota certificate of need law also states a clear preference for renewable energy, rather than non-renewable nuclear generation:

> The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, "renewable energy source" includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel. (*Minn. Stat. §216B.243, Subd. 3a*)

The Final EIS as well as further proceedings in this matter should provide more detailed analysis of a wholly or predominantly renewable energy alternative to replace the PINGP. Although the DEIS improved upon the Application, which gave no serious consideration to renewable energy, reliance on information prepared for the for the 2006 Monticello Project Final EIS is insufficient to analyze alternatives to Xcel's current PINGP proposals. (*See DEIS, Ch. 1, p. 50, note 128*).

First, in reviewing the impacts and costs of gas combustion to back up intermittent wind energy pending development of cost-effective storage technologies, the Final EIS should consider both the alternative of using capacity at existing natural gas plants and the alternative of repowering coal plants to natural gas to reduce greenhouse gas externalities. Although Xcel deferred consideration of repowering Black Dog coal combustion Units 3 and 4 in its February 9, 2009 Resource Plan Update (*Update, 2/9/09, MPUC Docket No. E002/RP-07-1572, p. 3)* repowering of the coal plant units could produce several hundred megawatts of generation, while reducing emissions and externalities. Minnesota policy supports the repowering of coal plants with natural gas to reduce mercury, nitrogen oxides, sulfide dioxide and particulates as well as carbon dioxide emissions, as reflected in the emissions reduction rider legislation, Minnesota Statutes § 216B.1692.

Second, in addition to the alternative of large wind energy conversion systems backed up with natural gas, the Final DEIS should analyze alternatives providing support for wind energy through smart grids and distributed generation or through transmission and purchased power

through the MISO market. This alternative becomes particularly salient after certification of the CapX2020 Brookings Project, which will connect to significant new generation capacity.

Current information and policy, including the 2007 Renewable Energy Standards, the 2008 Distributed Renewable Generation report, 2009 information regarding declines in demand and smart grid implementation, and the April 2009 approval of the CapX2020 Brookings transmission for wind energy should be used in the Final EIS to provide a robust analysis of alternatives to Xcel's PINGP consistent with Minnesota renewable energy and demand management policies.

4. Site Locational Issues, Cask Storage for Decommissioning and Alternative Sites

The independent spent fuel storage installation at the Prairie Island Nuclear Generating Plant has environmental and human site issues that should raise concerns in considering increased storage of highly radioactive nuclear wastes. PINGP is located on Prairie Island, an island terrace associated with the Mississippi River flood plain. (*DEIS, Ch. 1, p. 72*) The probable maximum flood at Prairie Island has been calculated to be 706.7 feet above mean sea level (MSL), while the surface of the nuclear spent fuel installation at the PINGP is only 697 feet above MSL. (*DEIS, Ch. 2, p. 28*).

The Prairie Island Nuclear Generating Plant is also located immediately adjacent to the Prairie Island Indian Community Reservation (*DEIS, Ch. 1, p. 57*) within the city limits of Red Wing and approximately 30 miles from the Capitol City of St. Paul (*DEIS, Ch. 1, p.2*). The estimated total permanent population within 50 miles of the PINGP is 2,949,234 - nearly three million people. (*DEIS, Ch. 1, p. 59*).

Despite these site factors, the DEIS included no analysis of seismic activity, weather, wind or geologic features that could affect long-term storage of nuclear wastes, or transmittal of radioactive materials through water or air. The DEIS did not compare security issues and maximum risks from cask failure at the PINGP site as compared to other locations.

Federal law does not prohibit the State from selecting nuclear waste storage sites within its borders. The DEIS did not evaluate the potential for spent fuel storage sites outside the PINGP boundaries due to an understanding that the Commission's authority is limited by State law to the storage of spent nuclear fuel generated by an existing Minnesota nuclear generation facility and stored on the site of that facility. (*See DEIS, Ch. 1, p. 16*). The DEIS assumed that at the end of the 2034 license renewal period the nuclear spent fuel installation at the Prairie Island Nuclear Generating Plant would store 34 additional casks for decommissioning, creating a total of 98 casks on the spent fuel storage pad at the PINGP upon removal of all spent nuclear fuel from the plant. (*DEIS, Ch. 2, pp. 22-23*).

It is interesting to the PINGP Study Group that, even when discussing decommissioning and the storage of nuclear waste for up to 200 years, the DEIS did not consider the possibility of another site for nuclear waste other than the PINGP site. We read applicable Minnesota statutes to explicitly authorize the Commission to grant certificates of need for dry cask storage for decommissioning a nuclear power plant at other locations within the State.

Minnesota Statutes 116C.771, enacted in 1994, states:

> (d) Except as provided under paragraph (e), dry cask storage capacity for high-level nuclear waste within the state may not be increased beyond the casks authorized by section 116C.77 or their equivalent storage capacity.
>
> (e) This section does not prohibit a public utility from applying for or the Public Utilities Commission from granting a certificate of need for dry cask storage to accommodate the decommissioning of a nuclear power plant within this state.

The Legislative authorization for additional dry cask storage enacted in 2003 does not eliminate this authority. The statute states, "The authorization for storage capacity *pursuant to this section* is limited to the storage of spent nuclear fuel generated by a Minnesota nuclear generation facility and stored on the site of that facility." (*Minn. Stat. 116C.83, Subd. 4(b), emphasis added*). The Commission's authority to certify dry cask storage for decommissioning a nuclear power plant is in a different section of statutes, enacted to balance a different set of competing policies.

The PINGP Study Group acknowledges that legislative change would be needed to authorize the siting of cask storage at a site other than the PINGP site absent the need to accommodate decommissioning of the nuclear power plant. However, when the long-term storage of nuclear wastes, including wastes from decommissioning, is proposed, the comparative unsuitability of the Prairie Island site becomes evident. An EIS need not conclude that another site will be chosen by decision-makers, some of whom may be elected officials, but it should explain the environmental and human risks that could be mitigated through consideration of alternative sites.

It is highly likely that the Yucca Mountain EIS, among other documents, provides a wealth of information as to criteria that make a site more or less suitable for the indeterminate long-term storage of highly radioactive nuclear wastes. It is also likely that the particular site characteristics of the spent fuel installation at the Prairie Island Nuclear Generating Plant would conflict with most reasonable criteria for site selection. Absent Xcel's requirement for transmission to the Twin Cities and abundant water to cool its nuclear reactor, it is unlikely that the best site alternative would be to locate radioactive materials below projected flood levels on the flood plain of the State's major river, the waters of which are used for public drinking water. It is also unlikely that the best site alternative would be to locate long-term storage of highly radioactive wastes within 30 miles of the State's capitol city and within 50 miles of its primary population center.

The Final EIS for Xcel's proposed cask increase project should propose criteria by which locations for nuclear waste decommissioning sites would be evaluated and, if possible, identify an alternative location to mitigate risks from storage of radioactive materials at the PINGP site. The Final EIS should also discuss, in its review of various canister and vault systems of storage (*DEIS, Ch. 2, pp. 44-45*) whether any of the alternatives would entail greater or lesser difficulty in removal and transportation off-site than would the proposed TN-40 and TN-40HT casks.

5. Environmental Justice Analysis

The nearest neighbors to the Prairie Island Nuclear Generating Plant are members of the Prairie Island Indian Community who live on the reservation. (*DEIS, Ch. 2, p. 9*). The Prairie Island Indian Community are part of a larger group called the Dwellers of the Spirit Lake (Mdewakanton) who have lived in this area of Minnesota for hundreds of years. They refer to themselves as Dakota or Lakota, words that mean "allies" or "friends" in several dialects. *(http://www.prairieisland.org/History.htm)* In 1936, the federal government officially recognized Prairie Island Indian Community (PIIC) as a reservation for the Mdewakanton, awarding them 534 acres. The Prairie Island Indian Community is a Federally Recognized Indian Tribe organized under the Indian Reorganization Act (*25 U.S.C. 476*).

In addition to living near the nuclear plant, the Prairie Island Indian Community operates its most significant business and recreational enterprises near the PINGP. The Community owns and operates Treasure Island Resort and Casino, employing about 1500 people. The Treasure Island Resort and Casino includes a 250-room hotel and convention center that is currently being expanded to include an additional 230 rooms. The expansion would include a 24-lane bowling center and a multi-use event center with a maximum seating capacity of 2,800. Treasure Island Resort and Casino offers gaming, dining, live entertainment, a 95- space RV park, a 137-slip marina to accommodate visitors arriving by the Mississippi River, and sightseeing and dinner cruises on their riverboat. (*DEIS, Ch. 1, p. 58, Ch. 2, p. 9*)

The DEIS mentions the fact that the persons most closely exposed to the human health risks of PINGP are members of Prairie Island Indian Community, but the DEIS contains no discussion of the environmental justice implications of increasing nuclear waste cask storage, increasing radiological impacts from the nuclear uprate or continuing a nuclear power land use in proximity to reservation lands, homes and businesses. In fact, even where the DEIS has an opportunity to evaluate whether the proposed action would have a disproportionate adverse impact upon the Prairie Island Indian Community, the DEIS fails to provide this analysis.

For example, in discussing the potential for cancer incidence related to the PINGP, the DEIS reports inconclusive information about Goodhue County, an area comprising 764 square miles, and then states, "This report was not able to address cancer rates in the Prairie Island Indian Community members who reside near the plant." (*DEIS, Ch. 1, p, 87*) The DEIS also discusses the "sociological impacts" of continued operation and increased cask storage at the Prairie Island Nuclear Generating Plant as compared with alternatives that would permit closure and decommissioning of the plant without even mentioning the Prairie Island Indian Community or the information provided through the Advisory Task Force regarding adverse social, psychological and spiritual impacts upon the Community from the presence of the nuclear power plant. (*ATF Summary, EIS Scoping Worksheet, p. 10*). Excluding all context or community input, the DEIS blithely concludes, "Continuing operations of the PINGP (no new land use) would likely have a neutral aesthetic and sociological impact." (*DEIS, Ch. 2, p. 56*).

The failure to analyze environmental justice impacts violates federal policy, state policy and legal precedent pertaining to environmental review. Federal policy is reflected on the U.S. EPA web site:

> Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies.
> (*http://www.epa.gov/compliance/basics/ejbackground.html*)

State policy, similarly is reflected in the commitment posted on the Minnesota Pollution Control Agency web site to ensure that minority and economically disadvantaged communities in Minnesota "do not bear a disproportionate share of the involuntary risks and consequences of environmental pollution." *(http://www.pca.state.mn.us/publications/p-gen5-01.pdf)*

Case law pertaining to environmental review consistently requires analysis of environmental justice. *DOT v. Public Citizen, 541 U.S. 752, 761 (2004)*. As stated in *Mid States Coalition for Progress v. Surface Transp. Bd., 345 F.3d 520, 541 (8th Cir. 2003),* "The purpose of an environmental justice analysis is to determine whether a project will have a disproportionately adverse effect on minority and low income populations."

The Final EIS for Xcel's proposed cask increase and uprate at the Prairie Island Nuclear Generating Plant must include an analysis of environmental justice, including whether a disproportionate share of the negative environmental consequences of the nuclear plant and nuclear waste storage installation are borne by the Prairie Island Indian Community. In this context, the PINGP Study Group suggests that an analysis of site criteria for potential alternative nuclear waste storage sites be included in the Final EIS, irrespective of the fact that an alternative location might require legislative action.

The past fifteen years of legislative history has demonstrated that the apparent limitation on casks in Minn. Stat. § 116C.771(d) did not prevent the Legislature's approval of additional high-level nuclear waste storage when it suited Xcel Energy's interests. The provisions of Minn. Stat. 116C.83 cited in the DEIS were the result of Xcel's 2003 lobbying in connection with those interests. If the failure of the responsible governmental unit to consider other locations for nuclear waste were based on an assessment that the only place that the Legislature might authorize storage of PINGP highly radioactive waste is adjacent to the Prairie Island Indian Community, this itself would be evidence of environmental injustice, potentially rising to the level of violation of civil rights and equal protection.

6. Demand Decline, Lack of Need for 164 MW Uprate

Factual information pertaining to the decline in Xcel's energy demand and preferences for demand management and renewable energy in Minnesota's certificate of need statutes (*see*

Section 3, supra) create an even more compelling need to review alternatives to the Extended Power Uprate in rigorous detail.

Demand information provided by the DEIS in connection with the need for the uprate is inaccurate and inconsistent with Minnesota Rules 7849.7030 which provides, "The commissioner [of the Department of Commerce] shall be responsible for the completeness and accuracy of all information in the environmental report." It appears to be a cut-and-paste from some other document, reflecting inapplicable circumstances. An excerpt is provided herein:

> The only information reviewed for this document regarding the feasibility of DSM is that information provided by Xcel Energy in its Certificate of Need Application, dated May 16, 2008. Xcel Energy concludes in its application that DSM is not a feasible alternative to the proposed project.
>
> According to Xcel, the demand for electrical power will continue to grow at an average rate of 2.6 percent per year or an average of an additional 240 MW for the Xcel Energy service area each year. . . Also, Xcel maintains that the additional power will be required in the summer of 2005. It is not practical to expect that the results of the program can be doubled or tripled in less than a year, the time remaining after the result of the Commission's Need decision. (*DEIS, Ch. 1, p. 25*)

A corrected analysis of potential alternatives to the nuclear power uprate in the Final EIS would begin with assertions of demand in Xcel's Application in this proceeding, which claims a 1.1 percent per year demand growth or an average of 133 MW per year. (*Application, 1-6, 1-7, 9-4*). The updated analysis would then examine more recent evidence of decline in demand in Xcel's SEC filings, February 9, 2009 Resource Plan Update and contemporaneous communications to the media. These sources identify a potential decline in electric demand through 2012 of at least 374 MW and potentially as much as 500 MW, as compared with the data in Xcel's Application. (*see Section 3, supra, pp. 9-10*).

Reviewing the projected energy deficits in Xcel's Application in light of this current information on energy demand, the urgency of the uprate disappears. The 2012 "deficit" of 228 MW projected by Xcel (*Application, Table 9-1, p. 9-5*) is more than met by the actual decline in Xcel's peak energy demand. Even if no other new resources are brought on line, Xcel will have a surplus of energy through at least 2012, providing ample time to consider energy alternatives that are more consistent with Minnesota energy policies.

7. Feasible Alternatives to Increased Non-Renewable Nuclear Generation

The DEIS discusses Xcel's proposed nuclear power uprate as if in a vacuum. Neither adverse environmental and health consequences nor economic externalities are considered. State energy policies favoring other alternatives are similarly ignored.

Xcel's proposed nuclear power uprate would require a higher thermal power level, more steam being produced by steam generators, more uranium loaded into the reactor core to

maintain the same fuel cycle length, larger diameter fuel pellets and fuel assemblies that would operate at higher temperatures than current Prairie Island Nuclear Generating Plant fuel assemblies. (*DEIS, Ch. 1, pp. 2, 4*). As a result the uprate would require major modifications including: upgrade high-pressure turbines, replace or rewind main generators, replace generator step-up transformers, replace moisture separator reheaters, upgrade isophase bus duct cooling. (*DEIS, Ch. 1, p. 2*). Although the Nuclear Regulatory Commission ("NRC") will analyze whether the uprate temperatures and pressures and the new fuel design are safe, no such analysis has yet been completed. (*DEIS, Ch. 1, p. 4*)

Even if the new uprate designs meet NRC safety requirements, the uprate would proportionately increase radionuclide releases from the Prairie Island Nuclear Generating Plant by at least 10 percent. (*DEIS, Ch. 1, p. 81*). The DEIS notes that this impact on exposure to members of the public would be most noticeable at times of refueling and maintenance, when the primary reactor system is opened:

> [D]uring refueling and maintenance operations, when the primary reactor system is open to the building atmosphere, small quantities of noble gases, halogens, tritium, and particulates are removed by the ventilation systems. . . Xcel Energy projects that the concentration of radionuclides in the gaseous radioactive effluents streams would, at most, increase linearly with power as a result of the proposed uprate, i.e., by approximately 10 percent. (*DEIS, Ch. 1, p. 81*)

The DEIS contains no independent analysis to evaluate whether radioactive releases would increase linearly or by some other function as heat and pressure increase. Further, while the DEIS emphasizes that radiological doses will be within federal regulations, this conclusion is insufficient to assess cumulative impacts on human health risks (*see Section 9, infra*) and insufficient for a policy analysis of feasible and prudent alternatives to an energy project.

In conducting a policy analysis of energy alternatives to a coal plant, for example, the ability of the plant to comply with regulations is assumed. Calculation of environmental externalities assists decision-makers in determining whether a project that might be legally permitted is, in fact, in the public interest. The DEIS adopts without any independent analysis Xcel's misleading present value of revenue requirements analysis. (*DEIS, Ch. 1, p. 30*). Xcel's arguably self-serving PVRR includes no externalities for the uranium fuel cycle, no externalities for emissions or waste resulting from nuclear power uprate and no alternatives based on demand side management, renewable energy or the repowering of coal plants with natural gas to reduce emissions.

The statement in the DEIS that replacing any of the energy provided by the nuclear power uprate with natural gas will increase carbon emissions and impact Xcel's ability to meet legislated carbon initiatives (*DEIS, Ch. 1, pp. 44-45*) is inaccurate. As the State's experience with the Metro Emissions Reduction Project (*MPUC, Docket No. E-002/M-02-633*) demonstrates, repowering of coal-fired units with natural gas substantially reduces carbon dioxide emissions, among other adverse impacts, while increasing dispatchable generation. Similarly, statements in the DEIS that purchased power is not a viable alternative due to the lack of transmission and generating capacity (*DEIS, Ch. 1, pp. 26, 43*) are obsolete, if they

were ever accurate. Approval of the CapX 2020 Brookings Project will permit Xcel to purchase new generation capacity, including renewable generation, to meet future energy demands.

The Final EIS pertaining to the uprate should not only reevaluate the need for an additional 164 MW of nuclear energy based on current electric demand information. The Final DEIS should analyze the cumulative impacts of the proposed uprate and externalities of increased reliance on nuclear generation.

The Final EIS should evaluate whether the proposed uprate is consistent with Minnesota certificate of need preferences for demand side management and renewable energy (*Minn. Stat. § 216B.243, Subd. 3 and Subd. 3a*) as opposed to the non-renewable nuclear generation proposed in the uprate. The Final EIS should provide a detailed analysis of alternatives to the uprate focused upon smart grid demand management and renewable generation. This analysis should evaluate backing up wind power with distributed generation or purchased power as well as the most economical back-up with natural gas in order to provide robust alternatives to the uprate reflecting Minnesota law, policy and public interests.

8. Mitigation of Non-Radiological Impacts of Uprate

Mitigation of the non-radiological impacts of the proposed uprate is a matter wholly within State jurisdiction. There will be no NRC evaluation of thermal impacts of the uprate on aquatic organisms or ice on Lake Pepin.

Given the clear articulation of concerns regarding thermal impacts of the uprate by the Minnesota Department of Natural Resources ("MDNR") (*Scoping Comments letter of M. Langan, MDNR Division of Ecological Resources 10/7/08 "MDNR Scoping Comments"*), it is puzzling to the PINGP Study Group that the DEIS both accepted the Applicant's claims regarding the insignificance of the thermal impact virtually verbatim (*Compare Application 8-12 to 8-16 and DEIS, Ch. 1, pp. 48-49*) and failed to consider mitigation specifically requested by the MDNR.

The DEIS' reliance on the Applicant's assertions rather than the expertise of the MDNR within its field of specialization is inconsistent with Minnesota Statutes 116D.03, Subd. 2 (2) which provides that state agencies shall use a "systematic, interdisciplinary approach" in decision-making that may have an impact on the environment and consult "with persons in appropriate fields of specialization so as to ensure that the latest and most authoritative findings will be considered in administrative and regulatory decision-making as quickly and amply as possible."

As excerpted below, the MDNR Scoping Comments proposed an auxiliary dry cooling tower to mitigate thermal impacts if the uprate were to be approved in order to reduce mortality of aquatic organism and risks to winter recreational users of Lake Pepin:

> Based on the proposed uprate, and increase in rejected heat, DNR requests that Xcel provide companion discussion of expanded cooling tower capacity that addresses the

> additional increment of thermal load to the river. The 10% increase in rejected heat, and maximum of 3 degrees F. increases at the discharge canal should be process treated through the use of an additional 10% (plus margin of safety) of cooling tower capacity. We suggest that an auxiliary dry cooling tower should be evaluated, which could address this new increment of thermal loading to the river, and eliminate any concerns of impairment to aquatic biota. This type of design would provide the partial cooling necessary during winter operation when the existing wet cooling towers would be subject to severe maintenance issues. This would prevent further deterioration of ice cover on Lake Pepin. A dry tower would also be able to provide backup capacity for those periods of low river flow and high atmospheric temperatures when PINGP is at or approaching an energy emergency.
>
> In order to maintain the established design proportions of cooling capacity to thermal output for PINGP, an additional (10%) of cooling capacity must be included in the uprate design. Without this action, the Exceedances of the 86 degree Fahrenheit summer temperature maximum will increase. While there are permit provisions (with MPCA notification) for these extreme periods and temperature violations, DNR does not want future plant operation to contribute any additional thermal pollution during these periods of high stress with potential mortality for aquatic organisms. . .
>
> The MDNR also has concern with increased thermal loading, during open cycle winter operation, contributing to the loss of fish life from cold shock. . . With an emergency shut down, there is a high degree of certainty that mortality will occur. We noted briefly a minimum of nine cold shock events since 1985, with loss of fish. Our communications with Xcel indicate that dead fish are generally counted within the discharge canal and that river currents do not make it conducive to account for fish that may have died in the river thermal plume. Again, addressing the increased potential for cold shock with an auxiliary tower would eliminate this resource concern. (*MDNR Scoping Comments, p. 2*)

The PINGP Study Group requests that the Final EIS include a detailed discussion of the mitigation measures proposed by the MDNR above. In addition, the Final EIS should evaluate measures to improve monitoring of fish mortality as a result of PINGP operations, including cold shock. This evaluation should consider methods to locate and count dead fish beyond the PINGP discharge canal.

9. Cumulative and Differential Analysis of Cancer Risk

Information regarding human health risk assessment for cancer as a result of the proposed radioactive waste cask increases, extension of reliance on the Prairie Island Nuclear Generating Plant and uprate increase in temperature and uranium are scattered throughout the DEIS. Although some important information is provided, it is neither complete nor assembled in such a way as to permit decision-makers to review the cumulative impacts of the Applicant's proposals on either workers or members of the public exposed to radiation.

The basic facts pertaining to the Prairie Island Nuclear Generating Plant and cancer are relatively clear-cut. High doses of radiation delivered in a short period of time, as in an atomic

bomb explosion or substantial release of radiation in the Chernobyl reactor incident, create substantial and immediate health effects due to irreparable cell death and damage. (*DEIS, Ch. 1, pp. 75-76*). Low-level radiation causes cancer, and the risk of cancer from low-level radiation is expressed as a probability. The best scientific evidence, cited in the DEIS, is that the relationship between dose and risk for low-level radiation exposure is linear, even at very low doses. "There is no *de minimis* does for which risks need not be considered; all doses present some level of risk." (*DEIS, Ch. 1, p. 18*).

Licensed activities utilizing radioactive materials require that licensees must achieve doses to workers and the general public that are as low as reasonably achievable (ALARA). (*Minn. R. 4731.2020*) External and internal doses of radiation should be summed for most occupational exposures. (*Minn. R. 4731.2030*). Minnesota law recognizes the vulnerability of the embryo/fetus to radiation. The dose to an embryo/fetus is the sum of the dose equivalent to the pregnant woman and the dose equivalent to the embryo/fetus from radionuclides in the embryo/fetus and radionuclides in the pregnant woman. (*Minn. R. 4731.2080*).

Minnesota rules and policies provide numeric guidance for carcinogenic risks (e.g. chemicals in groundwater or air) to which Minnesota citizens are involuntarily exposed. (*Minn. R. 4717.7100, Minn. R. 4717.8000*). These risks are considered in permit applications for air and water discharge and to determine the scope of voluntary actions to remediate pollution. Where a proposed action will result in carcinogenic exposure through more than one medium or chemical, these risks are cumulated in health risk assessment. (*Minn. R. 4717.7700, Minn. R. 4717.8550*). As stated in the DEIS, citing Minnesota Rules, the "acceptable level for additional lifetime carcinogenic risk" from contaminants is 1 in 100,000 (1 E-05)." (*DEIS, Ch. 1, p. 77, Minn. R. 4717.7300, Minn. R. 4717.8050, Subp. 3*).

Research cited by the DEIS demonstrates that there is an elevated risk of childhood cancer near nuclear facilities. As concluded in the *Archives of Environmental Health* study cited in the DEIS,

> Numerous reports document elevated cancer rates among children living near nuclear facilities in various nations. Little research has examined U.S. rates near the nation's 103 operating reactors. This study determined that cancer incidence for children < 10 yr of age who live within 30 mi (48 km) of each of 14 nuclear plants in the eastern United States (49 counties with a population > 16.8 million) exceeds the national average. The excess 12.4% risk suggests that 1 in 9 cancers among children who reside near nuclear reactors is linked to radioactive emissions. If cancer incidence in 5 western states is used as a baseline, the ratio is closer to 1 in 5. Incidence is particularly elevated for leukemia. Childhood cancer mortality exceeds the national average in 7 of the 14 study areas. (*Elevated Childhood Cancer incidence Proximate to U.S. Nuclear Power Plants, Archives of Env. Health, 2/1/2003, cited in DEIS, Ch. 1, p. 85, fn. 58*)

Cancer studies conducted by the Minnesota Department of Health from 1988-1992 in a large 10-county region and from 1988-1996, using the entire 764 square mile Goodhue County area as a data base (*DEIS, Ch. 1, pp. 85-88*), do not provide sufficient information to evaluate the

degree to which the Prairie Island Nuclear Generating Plant may or may not be increasing cancer rates. MDH studies may have been performed too soon to identify long-term effects. More important, the breadth of the geographic areas studied precludes analysis of effects near the source of low-level radiation. The MHD information cited by the DEIS adds little to the analysis of the potential health risks of Xcel's nuclear proposals. It does not relieve state agencies from the obligation to evaluate cumulative cancer health risks from an increase in casks storing nuclear spent fuel for the indefinite future, the long term extension of PINGP operations, and the increase in heat and uranium use for a proposed nuclear power uprate.

Even the incomplete information provided by the DEIS raises serious concerns about the increased cancer risks from Xcel's proposal to increase cask storage of radioactive waste. Without considering the probability of degradation over time, untoward weather or man-made events, the low-level radiation impacts to members of the public and to PINGP personnel from "skyshine radiation" alone would exceed Minnesota's 1 in 100,000 policy threshold for acceptable lifetime carcinogenic risk.

As noted in the DEIS, the cancer risk to the general public from "skyshine radiation" with 64 nuclear spent fuel casks is 2.8 in 100,000 (*DEIS, Ch. 2, p. 26*). The cancer risk to PINGP personnel from "skyshine radiation" alone is estimated at 98 in 100,000 for 48 casks (*DEIS, Ch. 2, p. 27*). Once the maximum exposure and dose rate occurs, when the 98th cask is placed on the pad at the PINGP, the cancer risk to nearest member of the public is projected to be 35 in 100,000. (*DEIS, Ch. 2, p. 35*). These risk levels to workers and to members of the public are an order of magnitude above what the DEIS has characterized as an "acceptable risk" under Minnesota Rules and policies. (*DEIS, Ch. 1, p. 77)*

The chart below summarizes the information in the DEIS (*DEIS, Ch. 2, pp. 26, 27, 34, 35; Ch. 1, pp. 81, 84*) concerning cancer health risk assessment.

PERSONS EXPOSED	**Route of Exposure**	**Casks**	**Cancer Risk per 100,000**
CASK INCREASE			
GENERAL PUBLIC	"skyshine radiation"	64	2.8
		98	35
PINGP PERSONNEL	"skyshine radiation"	48	98
USUAL OPERATION - PINGP			
GENERAL PUBLIC	Gaseous effluents		0.07
	Groundwater releases		0.28

It is recommended by the PINGP Study Group that a complete and cumulative assessment of human cancer risks be performed and set forth clearly in the Final EIS. A cumulative assessment of human cancer risks from the proposed cask increase and continued operation of PINGP would analyze at least the following risks of exposure to PINGP personnel and the public: risks from maintenance and repair of storage casks; releases from casks due to

degradation of materials, weather events, and man-made accidents or incidents over the indefinite period of time during which the casks would remain at the PINGP site; risks from continued operations of the PINGP including regular gaseous effluents, releases during maintenance and refueling, groundwater releases and food contamination; and some risk factor reflecting the potential of man-made accidents or incidents to increase radioactive releases from plant operations to air or groundwater. In addition, a cumulative assessment of the risks from Xcel's nuclear proposals would estimate the increased cancer risk to PINGP personnel and the general public from additional predictable releases from the proposed uprate and any increased risks of untoward releases that may result from the changes in reactor design.

In order to permit decision-makers to evaluate costs and risks of the proposed nuclear projects, the assessment should explain cumulative risks to both PINGP personnel and the nearest members of the general public if either or both the cask increase and the uprate are authorized. These risks should be expressed in terms of the 1 in 100,000 risk factor, which represents the upward bound of acceptable risk under Minnesota law. Increased lifetime cancer risks to members of the public should be identified for an embryo, fetus or child as well as for an adult.

In addition to requesting a comprehensive assessment of human cancer risks, the PINGP Study Group would repeat the requests made by the Advisory Task Force that the Final EIS identify best practices for radiological monitoring, including continuous monitoring of releases to air and groundwater, identification of dispersion plumes of radioactive isotopes and analysis of tritium contamination of wells. (*See ATF Summary, Meeting #3, p. 3, EIS Scoping Worksheet, p, 5*). For however long the Prairie Island Nuclear Generating Plant continues to operate and no matter how many casks of nuclear wastes are allowed on site, communities near the nuclear plant are entitled to the best available technology for monitoring radioactive releases that may affect their health.

Conclusion

Xcel's proposals to more than double cask storage of highly radioactive nuclear waste, extend operations of the Prairie Island Nuclear Generating Plan through 2034 and increase temperature, steam pressure and uranium usage for a 164 MW nuclear power uprate create the potential for significant adverse environmental and human health impacts and substantial economic costs and externalities. These proposals may conflict with Minnesota laws and policies regarding conservation, renewable energy, environmental justice and protection from unacceptable cancer health risks. New information undermining the likelihood that a federal nuclear waste depository at Yucca Mountain increases the probability that any additional nuclear waste stored at the Prairie Island Nuclear Generating Plant will be stranded there indefinitely. New data regarding declines in demand for electricity by Xcel Energy customers as well as recent approvals for transmission to support renewable generation capacity underscore the need for a robust analysis of alternatives to Xcel's nuclear proposals to determine if there are alternatives which are more consistent with State policies and the public interest.

The Prairie Island Nuclear Generating Plant DEIS contains substantial gaps that would prevent its compliance with applicable laws pertaining to environmental review and prevent it from serving to assist decision-makers in reviewing alternatives and mitigation measures that would protect the environment, reflect environmental justice and preserve human health. The PINGP Study Group respectfully requests that the additional analysis described in these comments be included in the Final DEIS for these projects to comply with law, aid decision-making and protect the public interest.

Sincerely yours,

Paula G. Maccabee
Counsel for the PINGP Study Group